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# A Survey of Personnel Testing in the Chicago Area

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A SURVEY OF PERSONNEL TESTING IN  
THE CHICAGO AREA

by

Roy S. Barr

A Thesis Submitted to the Faculty of the Institute of  
Social and Industrial Relations of Loyola Univer-  
sity in Partial Fulfillment of the Require-  
ments for the Degree of Master of Social  
and Industrial Relations

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## Life

Roy S. Barr was born in Chicago, Illinois, October 2, 1929.

He was graduated from East Troy High School, East Troy, Wisconsin, June 1947, and from Marquette University, Milwaukee, Wisconsin, February, 1952, with the degree of Bachelor of Science in Business Administration.

The author was in the U.S. Army from April, 1952 to April, 1954. He started work on his Master's studies in September 1955. The author has worked for a nationwide metal fabrication company for the past five years. He was first employed in the capacity of a Supervisory Trainee from May, 1954 through May, 1956. He was Assistant to the Personnel Supervisor from May, 1956 through October, 1956, Employment Supervisor from November, 1956 to July 1959, and Personnel Supervisor from July, 1959 to the present.

The author has worked with employee testing programs since October, 1956 and his interest in this area goes back several years prior to this date.

## PREFACE

The purpose of this survey was to evaluate the testing programs of companies in the Chicago area, and thus because of the wide variety of types of industry here to secure a good cross section of personnel testing in industry. A short history of testing practices in industry is given for background purposes and for better understanding. A detailed study of the testing practices of a large nationwide firm is reviewed.

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## CHAPTER 1

### SHORT HISTORY OF PERSONNEL TESTING IN INDUSTRY

Tests and measurements appear in history at an earlier age than the average person realizes. Quintilian, who was born in the year 35 A.D., made the following observation:

"It is generally and not without reason, regarded as an excellent quality in a master to observe accurately differences of ability in those whom he has undertaken to instruct, and to ascertain in what direction the nature of each particularly inclines him."<sup>1</sup>

The Bible also has reference to a form of testing:

"And the Gileadites took the passages of Jordan before the Ephraimites: and it was so, that when those Ephraimites which were escaped said, let me go over; that the men of Gilead said unto him, Art thou an Ephraimite? If he said, Nay; then they said unto him, Say now Shibboleth: and he said Sibboleth: for he could not frame to pronounce "it" right. Then They took him, and slew him at the passages of Jordan."<sup>2</sup>

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<sup>1</sup>F. D. Stoddard, The Meaning of Intelligence (New York, 1944), p.79

<sup>2</sup>G. C. Ross, Measurement in Today's Schools (New York, 1947) p. 27



In the first case stated above there was an interview observation test. Perhaps Quintilian also gave a written or oral test to his students. The second type of testing is still used in recent years. A very effective way to distinguish the Japanese spy from our Asiatic allies was to ask him to pronounce words which had letters which the Japanese soldier found very difficult to pronounce.

A sociologist attributes the remarkable stability of the Chinese civilization, the oldest culture of any modern nation, to five factors, one of which was her highly organized examination system. The Chinese testing program was organized informally in 225 B.C., and they developed a definite Civil Service examination in 29 B.C.<sup>3</sup>

In 1872 Darwin wrote several books on mental inheritance. He believed that facial expression and bodily postures seen during periods of strong emotion are not from observation and imitation but are inherited from man's pre-human ancestors. If certain facts such as frowning or uncovering the canine teeth in rage can be genetically determined he reasoned, why can't special talents, defects or even differences in intelligence be likewise handed down from parent to child? Galton noticed that eminent fathers are likely to have eminent sons and he also investigated the Darwin theory. In 1902, Galton endowed a permanent fellowship for the study of human inheritance at the University of London. This field was named "Eugenics". Galton was one of the first

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<sup>3</sup>Florence L. Goodenough, Mental Testing, (New York, 1949) p.31

to believe in the tool we now call "statistics".

Darwin, Galton and Spencer felt that much could be learned about mental behavior from the study of the early abilities and behavior of children. These tests showed the existence of behavioral sequences from child to child in pattern and order of development. This showed that tests of development could be devised.

Galton and Cattell regarded sensory and motor manifestations as related to the intellect. This opinion was strengthened by the observed fact that idiots and imbeciles are usually slow and clumsy and are relatively insensitive to pain.

In 1896 Binet published an article in which he described tests that he would try out with school children. These tests were to measure each of eleven "Faculties" or mental processes:

1. Memory
2. Mental Imagery
3. Imagination
4. Attention
5. Comprehension
6. Suggestibility
7. Aesthetic appreciation
8. Force of will as indicated by sustained effect in muscular tasks
9. Moral sentiments
10. Motor skill
11. Judgement of visual space<sup>4</sup>

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<sup>4</sup>Goodenough, p. 43

From these tests he tried to determine the extent the scores improved with age, school and attainment. Some of the measures stood up well under these trials: others showed so little differentiation between the groups that it was thought not worth while to experiment with them further. By the beginning of the 1900's Binet had accumulated a tremendous amount of data about the way children respond to a great number of different kinds of tasks.

Binet's first test, the 1905 Binet-Simon Scale, was a short combined test which tried to get a general idea of the child's mental development along as many different lines as possible by measuring it with a wide variety of tests. Binet felt that "The essential factor of intelligence is the ability to make sound judgements." He said "To judge well, to comprehend well, to reason well, these are the essentials of intelligence. A person may be a moron or an imbecile if he lacks judgment, but with good judgment he could not be either."<sup>5</sup>

Binet also defined the term "Intelligence Quotient" or "I.Q.". He found that children of the same age differed in their general mental development, and he tried to find the average intellectual achievement for each year of childhood and a way of measuring the individual child against these standards. Out of this came - I.Q., Intelligence Quotient or the expected mental age. For example, a child of ten is expected to have a mental age of ten. If he has a mental age of eight he has 8/10 of expectation or an I.Q. of 80. The generally accepted standards are;

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<sup>5</sup> Goodenough, p.48

Inferior - any I.Q. below 90

Average - any I.Q. between 90 and 110

Superior - any I.Q. above 110<sup>6</sup>

Another term which is frequently used in testing is "percentile". If a test score falls into the 80th percentile it means that it is above the score made by 80 per cent of others in the tested group on which the test was based.

In 1916, L.M. Terman of Stanford University published the famous Stanford Revision of the Binet-Simon Tests. In a sense this was the first real revision that had appeared since the time of Binet. For twenty-one years the Stanford revision maintained the leading position among the intelligence tests used both in the United States and abroad.

With the advent of World War 1, it was decided that some device for aiding in the classification of the large groups of men with military service as to general ability and as to specific talents was urgently needed. The chief aid to the army psychologists was a group intelligence test not yet published. This test had been developed by Arthur S. Otis. Otis turned over all his data to the government and it was upon his model that the famous Army Alpha test was constructed. The Beta test, which was constructed for use with illiterates, proved to be rather less dependable than the Alpha.

After World War 1 people had blind faith in the results obtained from the army tests. Industry embraced testing. As a result of too fast an acceptance and because unqualified people developed, administered and interpreted the tests, the experience in the area of testing was bad. The use of statistical

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<sup>6</sup>D. C. Hamm, "An Appraisal of Personnel Testing", Advanced Management, (February, 1956), p.16

methods as a means of demonstrating the worth of such devices was by this time in full swing. Few of the test makers had more than a rudimentary understanding of the procedures about which they talked so fluently. A good description of the condition of testing at this period is described by Florence L. Goodenough in her book, "Mental Testing". She said, "Mental ages and I.Q.'s obtained from half dozen different group tests were joyfully computed with as much assurance as their grandfathers had placed in the skull maps drawn up by their favorite phrenologist. The decade of the 1920's was the heyday of the testing movement, the age of innocence when an I.Q. was an I.Q. and few ventured to doubt its omnipotence."<sup>7</sup>

The misuse of testing during this period set the testing movement back decades in some areas. Industrial testing is not yet in a position of complete acceptance, it is still in a developmental stage. Both management and the unions are willing to give tests a chance to prove their values. Testing has survived the difficult period of rash acceptance, and has grown in recent years.

Listed below are the results of a series of surveys which give a picture of the testing pattern in industry since 1930:

1. 1930 - Scott Clothier & Mathewson

46% of the surveyed companies used tests<sup>1</sup>

2. 1935 - National Industrial Conference Board Survey

7.3% of the companies surveyed used tests

(there are two reasons given for the decline of testing between 1930 and 1935)

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<sup>1</sup> Goodenough, p.53

- a. the depression
- b. the testing balloon had burst<sup>2</sup>
- 3. 1939 - National Industrial Conference Board Survey  
14% of the companies surveyed used tests<sup>3</sup>
- 4. 1947 - Southern Division of the Institute of Industrial Relations  
of the University of California  
22% of the companies surveyed used tests<sup>4</sup>
- 5. 1956 - American Business Magazine - "How 58 Companies Use Tests"  
76% of the companies surveyed used tests<sup>5</sup>

The above surveys show that testing was widely used during the 1920's and when people became disillusioned in the 30's by the tests' results their use was reduced from 46% to 7.3% in industry.

Many tests now available in industry can be effectively administered and interpreted by non-professionals, for example; tests give a measure of basic intelligence, mechanical comprehension, clerical skills, manual dexterity, proficiency and acquired skills.

The largest part of our present total heritage of knowledge of personnel tests has come from governmental (including military) personnel research. There are several reasons for this. Industrial testing is not organized into

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<sup>1</sup>J.M. Lishon, "Use of Tests in American Industry - A Survey," Personnel, (January, 1948) p. 305

<sup>2</sup>Ibid.

<sup>3</sup>Ibid.

<sup>4</sup>Ibid.

<sup>5</sup>"How 58 Companies Use Tests." American Business (May, 1956)

programs as it is in the government. The research samples which are available in industry are smaller and industry has had less interest in reporting the results in meetings or in published articles.

The history of testing in industry is a history of the individual efforts of companies to initiate into their procedures a method to attain more efficiency in hiring, training and upgrading. They hope to reduce turnover and, therefore, become more efficient. It is a history of individual efforts of companies to meet their particular needs and it does not provide a pattern which can be followed such as we have in the governmental testing program.

The first step in obtaining information in the area of testing in the Chicago area was to send a questionnaire, see Appendix 1, to one hundred and fifty manufacturing companies in the Chicago area. The questionnaire asks thirteen questions concerning general company background and the testing programs of the companies selected. The list of companies surveyed was obtained from the "Directory of Large Employers in the Chicago Metropolitan Area", published by The Chicago Association of Commerce and Industry. The directory categorizes all manufacturers into fifteen product groups:<sup>1</sup>

Within the product groups the manufacturers were also grouped by size.

This selection was made in a random manner:

Group A - Over 1000 employees - 50 companies were selected

Group B - 500 to 1000 employees - 50 " " "

Group C - 250 to 500 employees - 50 " " "

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<sup>1</sup>Table 1, p. 9

TABLE 1

## PRODUCT GROUPS OF MANUFACTURERS SURVEYED

1. Chemical and Petroleum Products
2. Foods
3. Furniture and Wood Products
4. Primary Metal Operations
5. Fabricated Metal
6. Machinery and Mechanical Equipment
7. Electric and Electronic Machinery and Equipment
8. Transportation Equipment
9. Instruments
10. Textiles and Apparel
11. Paper and Paper Products
12. Printing and Publishing
13. Stone, Clay and Glass Products
14. Leather and Leather Products
15. Miscellaneous Manufacturers

The second area of research was to obtain interviews with two of the largest Consultant agencies in the city. These agencies were gracious enough to contribute several hours of their time in reviewing the services which they render their clients.

The third area of research involved reviewing the history of the testing program of a large metal fabrication plant of a nationwide manufacturing organization. The history of how the test battery was developed as well as the contents of the testing battery itself was reviewed.



[illegible]

Dear Sir:

As a graduate student at Loyola University majoring in Industrial Relations, I am conducting a survey of one hundred and fifty industries in the Chicago area as part of a thesis on industrial testing. I feel that since Chicago is a melting pot of industry this area will reflect testing practices in industry as a whole. This survey will be incorporated into the records at Loyola University and will be used as part of its records for future research.

Your help in this survey will be greatly appreciated. Please fill in the following information and return the form to me in the enclosed self-addressed and stamped envelope.

1. Name of Company \_\_\_\_\_  
2. Address \_\_\_\_\_  
3. Number of people employed \_\_\_\_\_  
4. Products manufactured \_\_\_\_\_  
5. Would you like a summary of the survey? \_\_\_\_\_  
6. Please check the groups that you test:  
    (a) unskilled \_\_\_\_\_  
    (b) semi-skilled \_\_\_\_\_  
    (c) skilled \_\_\_\_\_  
    (d) clerical \_\_\_\_\_  
    (e) supervisors \_\_\_\_\_  
    (f) salesmen \_\_\_\_\_  
    (g) executives \_\_\_\_\_
7. Please list the tests that you use (mark with an asterisk those that were developed by your company - a copy of these tests would be appreciated).
- (a) Factory:
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- (b) Clerical:
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

Please list any additional tests on the back of this survey.

6. For what purposes do you use testing?

- (a) hiring \_\_\_\_\_
- (b) training \_\_\_\_\_
- (c) promotions \_\_\_\_\_
- (d) attitudes \_\_\_\_\_
- (e) others \_\_\_\_\_

7. Do you have a psychologist to administer your testing program? \_\_\_\_\_

If not, who does administer the tests in your organization? \_\_\_\_\_

10. Do you use outside testing agencies? \_\_\_\_\_

If so, whom do the outside agencies test?

- (a) unskilled \_\_\_\_\_ (d) supervisors \_\_\_\_\_
- (b) skilled \_\_\_\_\_ (e) executives \_\_\_\_\_
- (c) clerical \_\_\_\_\_

11. If you do not use testing at the present time - have you ever done any testing? Yes \_\_\_\_\_ No \_\_\_\_\_

If you did testing in the past, why did you discontinue it? \_\_\_\_\_

12. May I use your company name in the summary? \_\_\_\_\_

If there are any aspects of your testing program that I have missed in this brief survey or if there are any comments or questions please put them on the back of this survey.

Thank you very much for your help.

Yours truly,

Roy S. Barr

## CHAPTER 11

### SURVEY OF INDUSTRIAL TESTING IN THE CHICAGO AREA

A total of sixty three companies (42%) responded to the requests for information.

TABLE 11

#### DISTRIBUTION OF RESPONSE OF SURVEY BY GROUP

Groups by number of Employees	Surveys Sent	Total Response	% of Response
Group A (Over 1000 employees)	50	24	48%
Group B (500 to 1000 employees)	50	19	38%
Group C (250 to 500 employees)	<u>50</u>	<u>20</u>	<u>40%</u>
Total	150	63	42%

TABLE 111

## DISTRIBUTION OF RESPONSE OF SURVEY BY PRODUCT GROUP

Product Group	Surveys Sent	Surveys Received	Companies who use Tests
1. Chemical & Petroleum Products	9	2	2*
2. Foods	9	5	2
3. Furniture and Wood Products	9	3	1
4. Primary Metal	15	5	1
5. Fabricated Metal	15	6	4*
6. Machinery and Mechanical Equipment	12	7	4*
7. Electrical Electronic Machinery and Equipment	12	4	2*
8. Transportation Equipment	9	5	3*
9. Instruments	9	4	3*
10. Textiles and Apparel	9	7	7*
11. Paper and Paper Products	9	5	3*
12. Printing and Publishing	9	4	3*
13. Stone, Clay and Glass Products	6	1	1*
14. Leather and Leather Products	8	4	1
15. Miscellaneous Manufacturing	<u>10</u>	<u>1</u>	<u>1*</u>
Total	150	63 (42%)	38 (60%)
* Over 50% of the companies who responded use testing			

Of the sixty three companies responding to the survey, thirty eight (63%) use tests. (Table 11). Only four of the product groups have less than 50% participation in some form of a testing program, indicating that testing is being used in almost every industry and is not restricted to any particular product group.

TABLE 1V  
PARTICIPATION IN TESTING BY COMPANY SIZE

Group by number of Employees	Number of Companies who use Testing	% of Companies responding who use testing
Group A (Over 1000 employees)	18	75%
Group B (500 to 1000 employees)	11	51%
Group C (250 to 500 employees)	<u>9</u>	<u>45%</u>
Total	38	60%

The returns indicate that large companies do more testing than small companies, as one could expect since the large companies have a more complex organization and, generally speaking, more money to spend on testing programs. The spread in the participation in testing programs between the large companies and the smaller companies is only about thirty per cent. (Table 111) This

difference is not as large as might be expected.

Group C has forty five per cent participation in testing. The over-all figure or sixty per cent participation is sixteen per cent below the seventy six per cent participation found in the 1956 survey mentioned on Page 7. However, the sixty per cent participation figure is more in line with estimates made by the various consultants interviewed.

#### WHO IS TESTED?

Figure 1 based on Table V gives a breakdown on testing by skill of the workers in companies grouped by number of employment.

The smaller companies do the most testing of the unskilled group, the larger companies do comparatively little testing of such workers.

All of the companies do extensive testing at the clerical level and the supervisory levels. It is interesting to note that the smaller companies do much more testing of executives than do the medium and large companies.

It is to be expected that the clerical group would be the most widely tested group, since there are many skills, such as typing and dictation, which are easy to measure and therefore easily tested. The supervisory and executive groups represent a large investment on the part of the company, which may account for the considerable amount of testing being done of these groups.

There is less testing done of the unskilled, semi-skilled and skilled workers than of the others. The large companies who test these workers generally have complete batteries. There are a surprisingly large number of personality tests administered by large companies to this group, for example, the Personality Record, Personal Audit, TAT, Thurstone Temperment and the Emotion Battery. Some of the smaller companies also administer interest and

and personality tests to the factory group.

TABLE V  
BREAKDOWN OF GROUPS TESTED  
BY  
SKILLS AND PROPER SIZE OF COMPANY

Skill of Workers	Group by number of Employees			
	A	B	C	Average
Unskilled	17%	27%	44%	26%
Semi-skilled	55%	27%	44%	45%
Skilled	72%	36%	56%	58%
Clerical	89%	100%	78%	89%
Supervisors	61%	64%	67%	63%
Salesmen	56%	77%	67%	63%
Executives	44%	45%	67%	52%

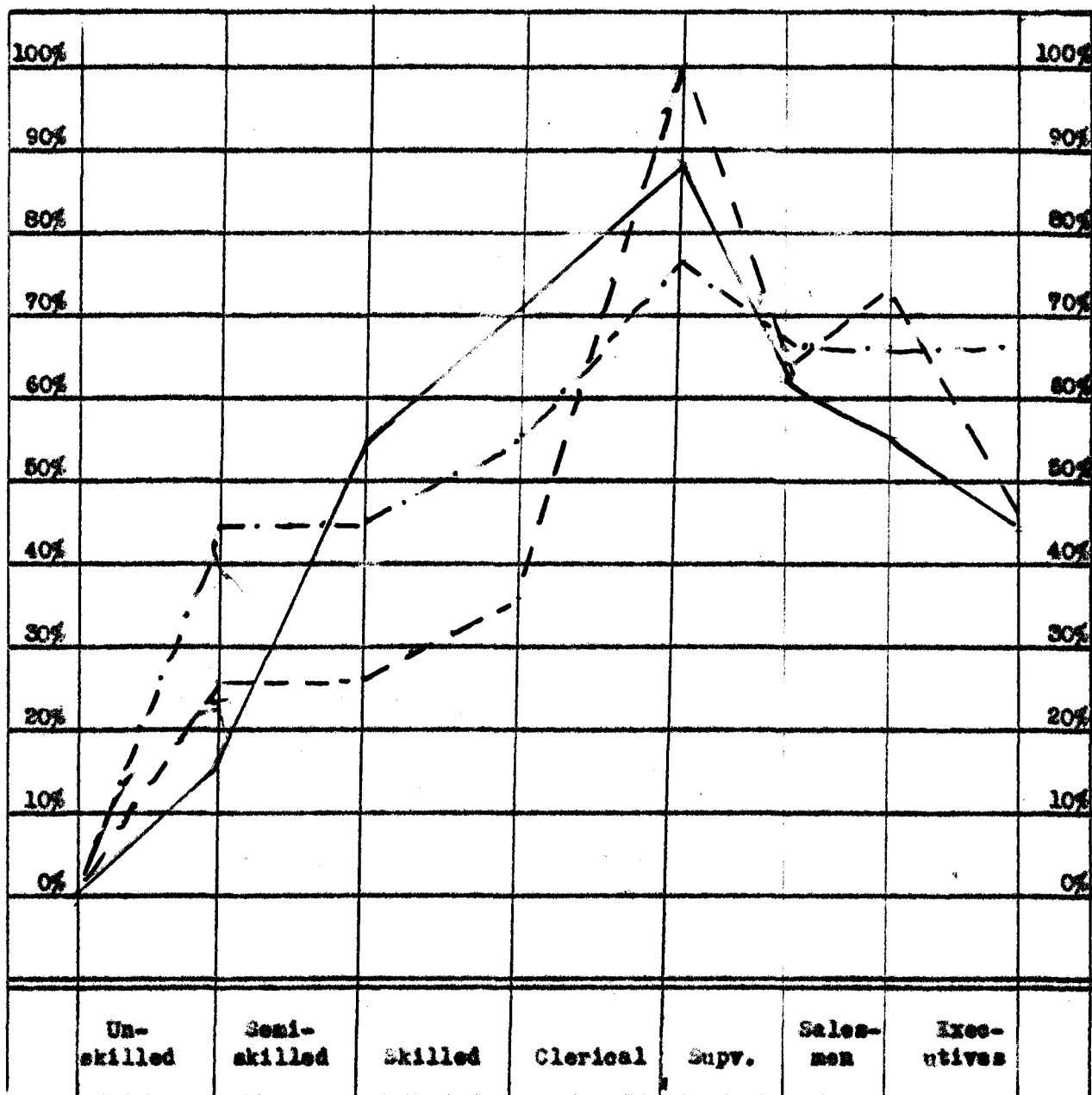


TABLE: \_\_\_\_\_ A - Companies with over 1000 employees.  
 \_\_\_\_\_ B - Companies with 500 to 1000 employees.  
 \_\_\_\_\_ C - Companies with 250 to 500 employees.

FIGURE 1

WHO IS TESTED - BROKEN DOWN BY SKILL AND COMPANY SIZE



For what purpose are tests used?

Table V gives a breakdown on how the tests are used.

TABLE VI  
WHEN TESTS ARE USED

Uses	Group A	Group B	Group C	Average
Hiring	89%	100%	89%	92%
Training	44%	27%	0%	29%
Promotions	61%	73%	67%	66%
Attitudes	27%	9%	22%	21%
Counseling	6%	9%	0%	6%
Transfers	0%	0%	11%	3%

The largest single use made of testing is at the hiring stage, because it provides the employer with a tool with which he can evaluate an applicant.

The next in importance is the use of tests for promotions to find out if the employee has potential to assume responsibilities which are more complex than those he has been assigned in the past. Consultants do a large part of the testing for promotional purposes.

It is interesting to note that, irrespective of size, approximately the same proportion of the different groups of companies use tests for hiring and promoting.

The small companies do not use any testing for training purposes while twenty five per cent of the medium size and almost fifty per cent of the large companies do.

Tests are used by a few companies in each group for determining attitudes. The larger and the smaller companies use attitude tests much more than do the medium sized companies.

Tests are used so infrequently for counseling and transfers that their use is insignificant.

#### Who Administers the tests?

Only four companies who have psychologists administering test batteries. Two of the "A" companies, and one "B", and one "C" company. In the case of the latter, the psychologist was the personnel director.

Three of the large companies employed men who are not psychologists but they have had special training in the development and administration of their test battery.

In all cases where tests were used, a representative of the personnel department administered the test batteries.

Fifty per cent of the companies who do testing use the services of outside testing agencies.

TABLE VII

## COMPANIES WHO USE OUTSIDE TESTING AGENCIES

Group A. . . . .	.28% use outside agencies
Group B. . . . .	.73% use outside agencies
Group C. . . . .	.67% use outside agencies
Average. . . . .	.50% use outside agencies

Below is a breakdown of the proportion sent to outside agencies for tests.

TABLE VIII

 PROPORTION SENT TO OUTSIDE TESTING  
 AGENCIES FOR TESTING

Classification	Group A	Group B	Group C	Total
Skilled and Clerical	*	*	*	*
Supervisors	60%	25%	50%	42%
Sales	20%	50%	67%	47%
Executives	40%	100%	100%	84%

\* Amount insignificant

The smaller and medium size companies for the most part utilize the testing agencies more than do the larger companies. Also, the testing agencies

are called on to evaluate the executive group more than any other group. Significant numbers of sales personnel and supervisors are sent to testing agencies for evaluation. The figures for clerical, skilled and unskilled personnel are not large enough to be significant.

In order to find out what types of tests and what services are provided, interviews were obtained at two consulting agencies in Chicago. Each of the agencies is large, well established and reliable and together they provide a clear picture of the function of the average consulting agency.

#### AGENCY A

Agency A offers the following services:

##### 1. Organization Planning

Establishing or formalizing the organizational structure of a company.

##### 2. Executive Development

Helps to point out men at all stages of development who have the capacity to become executives. Help in the division of work which provides each man with a step-by-step progression.

##### 3. Psychological Testing

Have tests which give reliable measures of executive, supervisory, sales and specialized technical abilities.

##### 4. Counseling, Consulting and Training

Whenever possible, testing is followed by a counseling interview. The agency consults with management about the men they have tested. They have a vocational counseling service

for individuals (high school seniors and up).

TABLE IX  
TEST BATTERY USED BY AGENCY A

Type of test	Name of test
Intelligence	<ol style="list-style-type: none"> <li>1. Speed test-revision of Alpha test</li> <li>2. Power test-developed by agency</li> </ol>
Personality	<ol style="list-style-type: none"> <li>1. Bernreuter</li> <li>2. Eysenck - Wadsworth</li> <li>3. Vernon - Allport Scale of Values</li> </ol>
Interest	<ol style="list-style-type: none"> <li>1. Strong Interest Test</li> <li>2. Michigan Vocabulary</li> </ol>
Aptitude  (Plus special tests for specific purposes)	<ol style="list-style-type: none"> <li>1. Bennett Mechanical Comprehension</li> <li>2. Minnesota Paper Form Board</li> <li>3. Minnesota Clerical</li> <li>4. Iowa English Aptitude</li> <li>5. Stanford Scientific Aptitude</li> <li>6. Meier - Seashore Art Judgement</li> <li>7. Seashore's Music Test</li> </ol>

The following is a typical example of how Agency A would screen and evaluate a group sent in by a client:

In this particular situation the client has a job opening and there are several applicants for the job.

The company involved would contact Agency A and the agency would ask for the background information about the job to be filled. The background information would include the descriptions of the job, the qualifications called for, the salary to be paid, the supervision which would be available and the amount of supervision which the man would have to give to others. If the company has any requirements as to age or other characteristics that information would also be obtained.

A route sheet is made out to schedule battery of tests which are to be taken by the men to be sent in for evaluation. When the men show up at the agency they are given some of the background of the tests they are about to take.

The normal battery of tests takes about a day's time to complete. The tests are scored and the results are entered on the route sheet. A member of the staff then writes a report on each man based on the test results. Another member of the staff makes his evaluation of the test results and his interpretation of the results.

Whenever possible, testing is followed by a counseling interview in which one of the staff psychologists presents the results discusses the test findings and the future prospects of the man. When interviews are not possible, some client companies ask that the agency write a letter to each man reporting on the psychological analysis of his abilities.

#### Agency B

Agency B offers the following services:

1. Recruitment

2. Psychological Testing
3. Job evaluation
4. Re-organization
5. Merit Rating
6. Salary Evaluation
7. Installation of Production Standards

The testing and interview procedures usually require from two and one-half to three hours. The standard rate for personal evaluations performed in the agency's offices is \$75.00. If the service is performed at the plant or outside the agency's offices the normal rate would be \$150.00 plus out-of-pocket expenses.

As part of the testing battery, interviews are conducted by trained psychologists. The interview is used as a means of assessing the experience and background that the person will bring to the job under consideration and it supplements the picture of the candidates abilities, aptitudes, personality make-up and motives obtained from the tests.

TABLE X  
TEST BATTERY USED BY AGENCY B

Type of test	Name of test
Intelligence	1. Schuber General Ability Battery Tests work knowledge reasoning computation logical reasoning
Personality	1. Employee Questionnaire, Form C - developed by agency
Special Aptitudes	Mechanical Design Clerical

What tests are used by companies and where the tests are obtained.

The companies surveyed use four categories of tests:

1. Intelligence
2. Aptitude and Ability
3. Personality and Interest
4. Miscellaneous Tests

Most of the tests are secured from three companies specializing in



industrial testing. Two of the three organizations develop a large percentage of the tests which they handle, the rest are collected from various sources:

1. The Psychological Corporation - most widely used testing house in the Chicago area has its headquarters in New York City.
2. Science Research Associates - second most widely used testing house has its headquarters in Chicago.
3. Industrial Psychology - The main offices are located in Tucson, Ariz.

TABLE XI

TESTS OBTAINED FROM THE PSYCHOLOGICAL CORPORATION  
WHICH ARE USED BY COMPANIES SURVEYED

Intelligence Tests	Aptitude and Ability Tests	Personality and Interest Tests
1. Wonderlic 2. Otis	1. Woody McCall Arith. 2. Bennett Mechanical Comprehension 3. Minnesota Paper Form Board 4. Minnesota Rate of Manipulation 5. Purdue - "Can you read a scale" 6. Minnesota Spatial Relations 7. Minnesota Clerical 8. Short Employment Test 9. General Clerical 10. Blackstone Steno. 11. How Supervise 12. Engineer and Physical Sciences Aptitude 13. Otis Arithmetic Reasoning	1. Allport-Vernon Study of Values 2. Minnesota Multiphasis 3. Study of Values 4. Strong Vocation Interest 5. Michigan Vocabulary

TABLE XII

TESTS OBTAINED FROM SCIENCE RESEARCH ASSOCIATES  
WHICH ARE USED BY COMPANIES SURVEYED

Intelligence Tests	Aptitude and Ability Tests	Personality and Interest Tests
1. SRA Verbal 2. SRA Non-Verbal 3. Thurstone Test of Mental Alertness	1. Purdue Electrical Aptitude 2. Purdue Mechanical Aptitude 3. SRA Mechanical Aptitude 4. SRA Arithmetic Reasoning 5. Purdue Pegboard 6. Flanagan Aptitude Classification 7. SRA Stenographic Aptitude 8. Thurstone Typing 9. SRA Typing 10. SRA Reading 11. Thurstone Clerical	1. Personal Audit 2. Kuder Preference 3. Thurstone Temperment

TABLE XIII

TESTS OBTAINED FROM INDUSTRIAL PSYCHOLOGY WHICH  
ARE USED BY COMPANIES SURVEYED

Intelligence Tests	Aptitude and Ability Tests	Personality and Interest Tests
1. Aptitude, Intelligence	1. Clerical Battery 2. Factory Battery	1. Emotion Battery 2. Supervisory Battery

TABLE XIV

## MISCELLANEOUS TESTS OBTAINED FROM TESTING AGENCIES

<u>Name of Test</u>	<u>Testing Agency</u>
1. Attitude Inventory ..... Survey	University of Chicago
2. Personality Record .....	Rhorer, Healer, Replogge
3. Humm Wadsworth .....	Kleinmann Counseling, Los Angeles, California
4. Guilford - Martin Personal Inventory .....	Sheridan Supply Co., University of Southern California
5. Runner Attitude .....	Runner & Associates, Golden, Colorado
6. Activity, Vector Analysis .....	Walter V. Clark Associates, Chicago, Illinois
7. Worthington Personality .....	Worthington Associates, Chicago, Illinois
8. Michigan Vocational Profile .....	World Book Company, Chicago, Illinois

Aptitude tests which were developed by individual companies:

1. Pipefitters
2. Electricians
3. Spray Test
4. Welders
5. Riveters
6. Machine Operators

7. Shipping Clerk
8. Lacing Operator
9. Sewing Machine Operators
10. Time Study Man
11. Editorial Writer
12. Key Punch Operator
13. Craftsmen and Engineers

Most of these aptitude tests which were developed by the manufacturing companies are on-the-job tests which quickly determine whether or not the individual being tested possesses the required skills.

There were sixty four different tests used by the group which was surveyed:

1. Seven different types of Intelligence Tests
2. Thirty different types of Aptitude and Ability Tests
3. Fourteen different types of Personality and Interest Tests
4. Thirteen miscellaneous tests.

TABLE XV

## SUMMARY OF WHICH TYPES OF TESTS ARE USED

Type of test	Factory	Clerical	Management
Intelligence	34%	76%	50%
Aptitude	42%	87%	45%
Personality & Interest	16%	29%	45%

The second most widely used type of test, the intelligence test, has the smallest variety of tests available.

The aptitude tests are the most widely used group of tests. This is the only area where there is any significant amount of test development at the plant level, they give results which are easily measured, and are relatively easy to administer and to score.

The Wonderlic and the Otis Intelligence Test are the most widely used of the intelligence tests. The Otis test takes about one half hour to complete and the Wonderlic test takes only twelve minutes to complete. Both tests are very easy to score and to interpret.

The unskilled and skilled group is not extensively tested and it is not surprising that most of the testing done with this particular group is in the area of aptitude and intelligence. The company which tests for aptitude generally gives some sort of intelligence test in conjunction with it. As was noted earlier, there are some small companies which administer personality and interest tests to the unskilled and semi-skilled groups in the factory.

More clerical employees, the most widely tested group, are given intelligence and aptitude tests than any other group. Skills such as typing, shorthand, filing and office machine operating are relatively easy to test. Since the clerical group deals with paper work rather than tangible objects the employers seem to feel that it is important to reassure themselves that these employees have at least an average amount of intelligence. However, only thirty per cent of the clerical group are given personality and interest tests.

Management personnel who are tested are generally given a complete test battery, this is the most thoroughly tested group.

The most frequently used test is the Wonderlic Intelligence test. Twenty two of the thirty eight companies who use tests use the Wonderlic test for an amazing fifty eight per cent of the total. The next most widely used test is the Thurstone Temperment test which is distributed by Science Research Associates.

Other tests which are widely used by companies surveyed include:

1. Minnesota Paper Form Board (aptitude)
2. Kuder Preference (interest)
3. Gilford-Martin Personal Inventory (personality)
4. Minnesota Clerical (aptitude)
5. SRA Mechanical Aptitude (aptitude)

## CHAPTER 111

### SURVEY OF PERSONNEL TESTING IN CHICAGO AREA OF A NATIONWIDE FIRM AND A DETAILED REVIEW OF TESTING PROGRAM AT ONE OF THE PLANTS

A pre-survey was made of Company "A" of the testing practices of eleven Chicago plants in the Chicago area of this large nationwide manufacturing firm. This survey was used as a pre-test for the questionnaire before the questionnaire was reviewed for criticism. Eleven plants make four different types of products and there are no uniform testing practices of any significance among the plants since testing is left up to the individual plants. Another factor which makes this individual study significant is the fact that several of the plants belonged to parent companies which were merged with this company in the fairly recent past.

A comparison is made of the testing practices of company "A" and an average response of the survey in general. A history of the testing program of one of the plants of company "a" is also reviewed.

#### Response

All eleven plants of Company "A" responded to the questionnaire. Seventy three per cent of the plants surveyed in Company "A" use tests and sixty per cent of the companies in the survey use tests.

#### Who is tested?

TABLE XVI  
WHICH SKILLS ARE TESTED

Skill Group	Company A	Survey Avg.
Unskilled	13%	26%
Semi-skilled	25%	45%
Skilled	38%	58%
Clerical	88%	89%
Supervisors	63%	63%
Salesmen	100%	63%
Executives	100%	52%

It is interesting that the testing pattern of this company fits into the general pattern of the main survey.

The eleven plants of company "A" which were surveyed represent seven different product groups which act as separate divisions and do not necessarily have any connection with each other in the area of testing.

For what purposes are the tests used?



TABLE XVII  
WHEN TESTS ARE USED

Uses	Company A	Survey Avg
Hiring	75%	92%
Training	50%	29%
Promotions	88%	66%
Attitudes	13%	21%

The main survey showed that the most frequent use of tests was for the purposes of hiring and promoting. Company "A" uses tests extensively during the hiring process but not as extensively as the other companies. Company "A" uses tests much more extensively for training than does the average company in the survey but only slightly more often than the large companies in the survey. (44%)

Company "A" does not have any psychologists administering the test batteries, and there are few administrators in company "A" who had special training in the area of testing.

In all cases, both in the survey and company "A" personnel men were the administrators of the test battery.

Fifty per cent of the companies surveyed use outside consulting agencies while seventy five per cent of the plants in company "A" use them. It is

general company practice for the plants in company "A" to use outside agencies for testing supervisors, sales personnel and executives.

The survey showed a very high usage of tests for the executive group. In the survey one hundred per cent of the B and C companies tested executives while only forty per cent of the large companies tested executives. Company "A" fits into the general pattern for the smaller companies rather than the large companies in this instance.

History of the testing program at one plant of company "A" in the Chicago area.

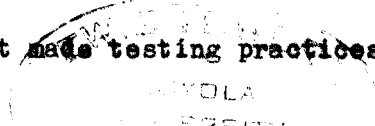
The following is a brief review of the testing program at one of the plants of company "A" and a short history on how the testing battery was developed. The author feels that this history is similar to the way other testing batteries in industry were developed. The people who developed this program had no previous formal instruction in testing.

Prior to 1956, this plant had two tests which were required because they were part of the written procedure on selecting machinist apprentice applicants. These two tests were:

1. Otis Quick-Scoring Mental Ability Test (intelligence)
2. Bennet Mechanical Comprehension Test (aptitude)

These two tests are excellent and were adequate for the purpose for which they were used.

The formation of the clerical union group at this plant provided the motivation to establish a testing program and establish sound testing practices which could be used as "past practice" for the purpose of up-grading clerical union members. A job posting clause in the contract made testing practices important.



The first problem in establishing a testing program was to convince both the clerical group and the management of the importance and value of a sound testing program, which was designed to test two areas:

1. Intelligence
2. Aptitude and Ability

The following is the test battery which was adapted by the plant:

#### Intelligence Tests

- A. Wonderlic (Forms A, B, D and F)
- B. Otis Quick-Scoring Mental Ability Test
- C. Chicago Non-Verbal (for those who are handicapped in the use of the English language)

#### Personality

- A. Stevenson, Jordan, Harrison Personality Test

#### Aptitude, Ability and Interest

- A. General Clerical Test
- B. SRA Typing Skills
- C. Stenographic Ability
- D. Bennett Mechanical Comprehension Test
- E. Bennett Hand Tool Dexterity Test
- F. Stromberg Dexterity Test
- G. Purdue Test for Electricians
- H. Purdue Test for Machinists and Machine Operators
- I. Calculator Operator Test
- J. Comptometer Operator Test

Testing at the plant level is used at this plant as an aid in determining the qualifications of new employees, in upgrading maintenance and skilled employees and as aid in determining training needs for employees who are presently performing on skilled jobs.

The tests were added to the testing battery in the following sequence and for the following reasons:

1. Wonderlic Test Otis Quick-Scoring Mental Ability Test & Bennett Mechanical Comprehension Test - recommended by division office and in use for a number of years.
2. Chicago Non-Verbal - obtained to test employees who could not speak English.
3. Bennett Hand Tool Dexterity Test - obtained to test hand tool dexterity of applicants for skilled jobs and applicants for training for skilled jobs.
4. Stromberg Dexterity Test - was obtained for the purpose of testing finger dexterity of all female applicants before hiring. The assembly department was experiencing an excessive turnover of female hires because they could not do one of the basic jobs which required a large amount of finger dexterity. The test was very successful in reducing the turnover rate.
5. Stevenson, Jordan, Harrison Personality Test - was used on an experimental basis only.
6. SRA Typing Skills - used for clerical applicants and for upgrading.
7. Stenographic Ability - used for clerical applicants and for upgrading.

8. General Clerical Test - several general clerical tests were tried and the Psychological Corporation's clerical ability was chosen for clerical ability was chosen for clerical applicants.
9. Calculator Test - was developed by the plant from tests and materials obtained from the Marchant Company School. Used for new hires and up-grading.
10. Comptometer Test - was developed by the plant also. The material was obtained from the Comptometer Company School.
11. Purdue Test for Electricians - this test had not been put to extensive use at the last contact that the author had with the plant. The maintenance department felt that there were several electricians who needed training. This test was to be used to try to determine how much training was needed.
12. Purdue Test for Machinists and Machine Operators - this test measures the basic knowledge of machine shop operations and is used for new hires in the machine shop.

In order to give the reader a good understanding of how the testing battery was used, below is a summary of when and how the test battery is used.

1) New Employees

A) General factory

1. male - no tests are being used
2. female - Stromberg Dexterity Test (finger dexterity)

B) Clerical

1. Male

- a. Wonderlic
- b. Stevenson, Jordan and Harrison
- c. General Clerical Test
- d. Comptometer Test (if applicable)
- e. Calculator Test (if applicable)

## 2. Female

- a. Wonderlic
- b. Stevenson, Jordan, Harrison
- c. General Clerical Test
- d. SRA Typing Skills (if applicable)
- e. Stenographic (if applicable)
- f. Comptometer Test (if applicable)
- g. Calculator Test (if applicable)

## C) Skilled Employees

### 1. Male

- a. Wonderlic
- b. Bennett Mechanical Comprehension
- c. Bennett Hand Tool Dexterity Test
- d. Purdue Test for Machinists and Machine  
Operators (if applicable)
- e. Purdue Test for Electricians (if applicable)

## 2) Up-grading Clerical and Factory Employees

### A) Placement into machinist, maintenance or skilled training

- 1. Wonderlic

2. Bennett Mechanical Comprehension
3. Bennett Hand Tool Dexterity Test
4. Purdue Test for Machinists and Machine Operators (if applicable)

B) Up-grading clerical employees

1. Wonderlic
2. Stevenson, Jordan and Harrison
3. General Clerical Test
4. SRA Typing Skills (if applicable)
5. Stenographic (if applicable)
6. Comptometer Test (if applicable)
7. Calculator Test (if applicable)

3) Determining training needs for factory and clerical areas. (This area of testing usage was in the experimental stage.)

A) Factory

The Purdue Test for Electricians was going to be administered to all Plant Electricians to help determine type and extent of the on-the-job training which was being planned for some of the plant electricians.

B) Clerical

The Calculator Test was to be administered to all calculator operators. The Marchant Company was to conduct classes for all calculator operators. These classes would be free and in addition, free classes were offered to employees who wished to be

trained on the use of the calculator on the employees own time. These basic classes for beginners were held on a Saturday and were very successful.

The testing program at this plant was very well received by both management and the employees. It was developed over a period of years and most of the tests were added to the battery as a result of a need in the plant.

Management felt that the success of the program at this plant was attributable to the fact that it was built slowly, as it proved its usefulness and as it gained acceptance. They also felt that the program's main purpose was to evaluate and measure an employee's intelligence and ability. The employee who was tested and the supervisor involved were allowed to compare the test results with their own evaluation of those areas of the employee's make-up. The cloak of mystery was carefully avoided on the theory that what people don't understand they don't trust. The results of the tests were reviewed with those who were tested if they requested the review. Many of the supervisors were given tests in private and the results were reviewed with them so that they would have a basic understanding of the tests.



## CHAPTER IV

### SUMMARY AND CONCLUSION

The response to the survey was very even. There was a forty eight per cent response by the large companies, a thirty eight per cent response by the medium sized companies and a forty per cent response by the smaller companies; an average response of forty two per cent.

At least one company in each product group replied that they use tests in some form.

The survey indicated that the larger companies do more testing than do the smaller companies although there was only a thirty per cent spread between the two groups: Seventy five per cent of the large companies who responded to the survey indicated that they do testing, fifty one per cent of the medium size companies indicated that they use tests and forty five per cent of the small companies indicated that they use some form of testing for an over all average of sixty per cent.

We have found out that companies from all aspects of industry use testing and that as a general rule the larger companies use tests more than do smaller companies. The next question to be answered is - Who is Tested?

The largest two groups who are tested are the clerical group and the management group. The clerical group is generally given tests in two areas; (1) Intelligence (2) Clerical Skills. There is a very easy, inexpensive in-

telligence test which can be given and it is apparent even to a novice that it is a good idea to test typing and shorthand skills of clerical employees who will be required to spend most of their time using those particular skills. There are many varieties of tests which will test clerical skills and they are, once again, easy and inexpensive to administer and interpret. The personnel people who are responsible for administering tests have faith in their simple intelligence and clerical aptitude tests.

It is also recognized by industry that it is important to evaluate management and executive personnel. Most companies who do a thorough investigation in this area depend on experts, namely, outside consultants. Outside consultants are relatively expensive and because of this expense, their service are generally limited to management personnel.

The smaller companies who have testing programs tend to test at every skill level. The range of testing for skill groups goes from twenty per cent for the unskilled group to eighty nine per cent for the clerical group. The other groups range in between these figures.

The small companies do more testing at the unskilled and semi-skilled levels than do the larger companies. It is possible that the smaller companies feel that they are in a position to test the unskilled employees because they do not do as much hiring at this level as do the large companies. The large companies generally do testing when the employee eventually make application for a semi-skilled or skilled job. The fact that the smaller companies are attempting to administer these more technically complicated tests to semi-skilled employees in what appears to be a "hit and miss" method makes one

question the administration and interpretation of these particular tests.

The small and medium sized companies do the same amount of testing at the management level as do the large companies.

The bulk of testing is done at the hiring and promoting stage. An average of ninety two per cent of the companies who use tests do some testing during the hiring process. Almost everyone tests the clerical applicant who applies for a job. This is partly due to the fact that many employers feel that if a clerical employee has aptitude and intelligence he can do a good job. The employers feel that a large amount of personality is not necessary at the clerical level and that if the employee is considered for a job which will involve personality to a larger extent a personality test will be given at this time. An average of sixty six per cent of the companies use testing when promoting. Almost all of the companies test management people who are promoted. Only the large companies use testing to any extent for training.

In all cases the personnel department administers the testing program.

#### Outside Consulting Agencies:

An average of fifty per cent of the companies use the services of consulting agencies to evaluate their employees. Approximately seventy per cent of the small and medium size companies use consulting agencies. Only twenty eight per cent of the large companies use the services of these agencies. The smaller companies rely very heavily on these agencies to aid them in the selection of executives. They also use them frequently for aid in the selection of supervisors and salesmen.

Since the smaller and medium sized companies are generally unable to develop costly management development programs, they depend on consulting agencies for evaluation of their management group. This is especially true at the executive level.

Most large companies have organizational development programs and these companies screen and evaluate their management people at early stages of employment. The large companies also have an advantage because of a broader knowledge of executives in the field and are better able to obtain information regarding applicants.

One outside testing agency has a free testing service. The State Employment Office in most states has a free testing service which is available to all companies who wish to have applicants processed through it. This agency will administer a long, complex testing battery to any applicant at the State Employment Office - free of charge.

Only one company in the entire survey stated that it uses the services of the state agency for testing purposes. There are two reasons which contribute to the lack of patronage of this free service:

1. The state will only distribute limited literature concerning the test battery.
2. The industry representatives which contact the various industries in the area know very little about the testing services of the state.

The industry representatives are unable to do a good job of selling the testing service to industry and as a result the service is not used. Industry will not use something with which it is not familiar. The State Employment Testing Service could be an effective unit of the State Employment system if it

would train its industrial representatives in the area of testing services so that the representatives would be able to sell the testing program. It would also help if it would release more information concerning its testing program so that employers could become familiar with the services and the testing battery of the state agency.

### Obtaining Tests

The tests which are being used by industry are obtained from four main sources:

1. The Psychological Corporation
2. Science Research Associates
3. Industrial Psychology, Inc.
4. Tests which are developed by the individual companies

The three testing houses which are listed above are the most widely used in the Chicago area. There are many other agencies and consulting firms who furnish test batteries.

The Psychological Corporation carries the most complete line of tests of any agency referred to in the survey. Some of the tests which they offer have been developed by the Psychological Corporation but most of the tests are obtained from other sources. A large portion of the tests offered by both Science Research Associates and Industrial Psychology have been developed by these organizations. All three organizations have good reputations and may be used with confidence by employers.

The other source of tests furnished is the companies themselves. Most of these tests are aptitude tests which are either "on-the-job" or simulated "on-

the-job" situations. There is no need to go into much detail on these tests because they are designed for specific situations and although they may not be scientific they are very effective.

The most widely used type of test is the aptitude test. Of the fifty one tests obtained from the testing firms which are used in the Chicago area, thirty are aptitude tests.

The most widely used test in industry is the Wonderlic Personality Test which is an intelligence test. This test is used by fifty eight per cent of the companies who use testing. This is a remarkable usage in an area where everyone had a different idea regarding which tests are effective. This is partly due to the fact that it takes only twelve minutes to administer, costs only ten cents a copy, is easy to interpret and has several different versions which makes it difficult for employees to cheat on the test. Probably the most important reason why the Wonderlic test is popular is that it has proven very reliable.

The average personnel man who is responsible for the testing program for a small or medium sized company does not have the time nor does he possess the background for a thorough investigation of tests. Cost, administration, time and ease of interpretation, are all very important factors in a testing situation in industry. The Wonderlic test is one of the few tests which is reliable, inexpensive and easy to work with.

Twenty six of the forty two tests used by the companies surveyed are aptitude tests. Even though there are only six different intelligence tests used by the firms who were surveyed these six intelligence tests have almost as much

usage as do the twenty six aptitude test. Personality and interest tests do not have extensive usage except in the management area.

In the cases where the small companies are giving personality and interest tests to unskilled and semi-skilled employees the author feels that their efforts are being mis-directed. The over-all test batteries of these companies show a lack of understanding of testing. In some cases a person who was well informed in the area of testing had previously held the personnel job and introduced several tests.

#### Study and history of a testing program of one company in the Chicago Area

The detailed study of Company "A" showed a good correlation between that company's testing practices and the testing practices of the other companies surveyed.

A detailed history of the testing program of one of the plants was reviewed along with a detailed summary of the testing program of the plant.

The testing program in the plant studied was developed as the need arose for various tests. There was not a spontaneous drive to install a testing program. The test battery is concerned almost exclusively with intelligence and ability. This company uses a consulting agency to evaluate the personality.

Each test used in the plant which was studied was brought into the testing battery as a result of a specific need and the need was generally created because of the restrictions or rules in force because of a union agreement. The battery which was developed will undoubtedly be expanded on and improved upon. This testing battery is a tailored program designed for the specific problems peculiar to this plant.

If testing has proven to be valuable in a few areas then why isn't it used in more areas of industry? This survey shows that there are several reasons why testing is not put to more uses. Testing must be sold to management. A testing program costs money and takes valuable time to administer. Personnel people in general are not familiar with tests, what they can do, where to obtain them, and are not qualified to do a real selling job.

There were only a few personnel people in this survey who had special training in the area of testing. The need for testing is apparent but it seems that very few attempts are being made by those responsible to become acquainted with testing practices. Most people seem to feel that a knowledge of testing can be acquired only in a graduate school or that it requires a background in psychology.

The large testing companies could and should do a much better selling job by lessening the emphasis on interest and personality tests in their booklets and applying more emphasis on the more practical tests and how to use these tests. Most of the better tests which have been developed have been developed by universities for situations other than industrial problems and needs.

If a company decides to go all out in the area of testing it can go to a consulting agency and have the agency review its testing needs. These agencies will then develop a test battery designed for the needs of the plant which is using its services. These batteries are sometimes satisfactory, but they do not always provide for changing situations which arise in the plant. The cost of having a "tailor made" testing battery is very high and most companies will not invest this much money unless the decision comes from top levels of management.



Large nationwide organizations with many plants find themselves with several combinations of testing batteries at the various plants. This is an unusual phenomenon because it is common practice for these large companies to have uniform practices in most areas of their operations. Because there is no central guidance and because there is no real attempt in educating personnel men in the use of testing tools the field of personnel testing in industry has grown up on a basis of "hit and miss".

In the author's opinion responsible people in industry should first decide what they want to accomplish, start off with a small testing battery and develop the battery slowly. Some of the most effective testing batteries have been confined to testing intelligence, aptitude and ability. Once the immediate goals have been established the company then can select the tests which will accomplish these goals. The company must establish what are satisfactory scores and build a testing pattern by keeping good uniform records.

Let's take a hypothetical situation. Company X decides that it would like to test the intelligence and clerical skills of its clerical employees. It also feels that it should test the intelligence and mechanical aptitude of its employees before they are assigned to positions which will require the investment of expensive training. The company also feels that it should test employees or applicants before they are put into management positions. With the exception of the management group a relatively simple test battery would suffice. The tests would not need to be involved with the employee's personality but only with the problem of whether or not the employee has the basic ability to grasp the technical work which will be assigned to him. The test battery can then be expanded to meet the expanding needs. In order to sell a testing battery to management

the approach must be practical. The most important aspect of the testing program at this point is not to expect that all of the employees will fit into the work situation into which they are being placed. They may not be accepted by the group with which they are to spend the next several years or they may not be motivated to do a good job even if they have the basic ability to do it. They also may develop personal problems at work or at home which will make them undesirable workers.

The important bench mark to use as a check on the testing program is the turnover rate in the areas which will be tested both before and after the use of tests. The quality of work produced by the employees selected, both before and after the use of tests is another bench mark. A testing program is predicated on the theory that the employees will still be given a thorough screening and that the test battery will be used only as one more tool in the screening process.

The employer has taken the element of guess out of the areas of intelligence and aptitude. If a good selection has been made the employer is reasonably certain that the employee can do the job if he is properly trained and has proper motivation. The employers selection procedure should be more efficient with the testing tool.

This survey has demonstrated that tests are being used as a tool but educators, industry and the companies which furnish industry with tests are still at the hand tool stage in the development of their testing batteries. It will take a lot of work and interest before this hand tool will be converted into a smooth working machine.

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## APPROVAL SHEET

The thesis submitted by Roy S. Barr has been read and approved by three members of the faculty of the Institute of Social and Industrial Relations.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval with reference to content, form, and mechanical accuracy.

The thesis is therefore accepted in partial fulfillment of the requirements for the Degree of Master of Social and Industrial Relations.

June 1, 1960

Date

Signature of Advisor